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reggert@mayerbrown.com

April 24, 1997

VIA HAND DELIVERY

RoseMarie Cazeau
Assistant Attorney General
100 West Randolph Street
12th Floor
Chicago, Illinois 60601

    Re: **Midwest Metallics LLP**

Dear Ms. Cazeau:

    Enclosed is an original and two copies of the "Residue Volume Calculation For Mt. Pielet," prepared by W.Z. Baumgartner & Associates, Inc. This is the document promised to you at the April 10, 1997 meeting at EPA.

        Very truly yours,

        Russell R. Eggert

RRE:emk
Enclosure

cc: **Sherry Estes** (w/encl.)
     Terrence J. Coogan (w/o encl.)

RESIDUE VOLUME CALCULATION

FOR

MT. PIELET

MIDWEST METALLICS, L.P.
SUMMIT, ILLINOIS

APRIL 1997

W. Z. BAUMGARTNER & ASSOCIATES, INC.
Environmental Consultants
P.O. Box 786
Brentwood, TN 37024-0786

97031

RESIDUE VOLUME CALCULATION

MIDWEST METALLICS, L.P.
SUMMIT, ILLINOIS

TABLE OF CONTENTS

EXHIBITS

RESIDUE VOLUME CALCULATION

MIDWEST METALLICS, L.P.
SUMMIT, ILLINOIS

1.0 INTRODUCTION & PURPOSE

Midwest Metallics operates an auto shredding and metal recycling facility as located on Exhibit No. 1. Non-metallic residue is stored at various locations around the property awaiting processing. The pile at the southeast end of the property has been the subject of study by the EPA, state, and local environmental authorities. The volume of the pile is the subject of the report with the range of volumes calculated varying between 150,000 cubic yards and 180,000 cubic yards.

2.0 SCOPE

The volume of the pile was calculated using two different methods and independently by rough approximation. Because of the differential between the volumes previously indicated and the calculated volumes, the initial method of calculation was recalculated independently on three occasions.

3.0 INITIAL METHOD

Estimations done by W. Z. Baumgartner and Associates, Inc. showed the pile to be between 150,000 cubic yards and 180,000 cubic yards. The higher number was arrived at by taking the highest possible value of each elevation contour and by overestimating the area. These estimations were done by placing a very tight grid over a contour map of the pile. The contour map was drawn from survey measurements and air photos by Air Maps, Inc. as shown in Exhibit No. 2.

By isolating the pile and placing a grid over the contours, one can estimate the height sections of the pile within 5 feet in a 10 foot by 10 foot square cell. Over 2000 of these cells

were then added to get the cumulative volume. For example, cell G387 may be over the contour of 640 feet above sea level. This meant that at that point, the pile is 30 feet high. The datum used was 610 feet above sea level. This method was repeated three times to ensure accuracy with using the process described in Exhibit No. 6.

4.0   METHOD TWO

The new calculations contained within this report adhere to standard surveying methods of determining earth removal. By using sophisticated software within the AutoCAD program, it is possible to arrive at a volume of the residue pile. The mathematics are shown along with the contour map on Exhibit Nos. 3, 4, and 5 with the Residue Volume shown as Table No. 1.

First the area enclosed by each five foot contour is found. This is done by using a built-in planimeter in the AutoCAD program. AutoCAD utilizes the trapezoid method of area calculation. This is explained, along with an example on Exhibit Nos. 4 and 5. According to standard calculus textbooks, the error is dependent upon number of data points. The accuracy of AutoCAD is within 1% of a hand-held planimeter.

Once the area enclosed within each contour is determined, the volume is calculated using volume end area mathematics contained within all surveying texts. An example of this calculation is shown on Exhibit No. 5. The sum of individual volumes comprise the total volume of the residue pile.

5.0   ASSUMPTIONS

Assumptions for these calculations are dependent upon:

- The pile has not changed in size since the air photo was taken

- The base elevation of 610 feet represents a total "flattening" of the pile

- The error in calculations is less than the error due to accumulated void space in a cubic yard of residue

2

TABLE NO. 1

RESIDUE VOLUME CALCULATION

APRIL 14, 1997

AREA COMPUTED BY TRAPEZOID RULE
VOLUME COMPUTED BY AVERAGE END METHOD

CONTOUR	AREA	VOLUME
610	189758	
		865200.0
615	156322	
		732795.0
620	136796	
		643952.5
625	120785	
		573322.5
630	108544	
		502342.5
635	92393	
		406572.5
640	70236	
		248660.0
645	29228	
		106112.5
650	13217	
		35107.5
655	826	

Total Area	728347.0 sq ft
Total Volume	4114065.0 cu ft
	152372.8 cu yds
BEST ESTIMATE	**150,000 CUBIC YARDS**

6.0   CONCLUSION

The volume has been estimated or calculated four times using two different methods. The volume has been submitted twice in the last year. Three times, the total volume of the pile was estimated at 150,000 cubic yards. The other time, when overestimation of height and area were used, the value was approximately 180,000 cubic yards. The new calculation of 150,000 cubic yards is by far, the most accurate.
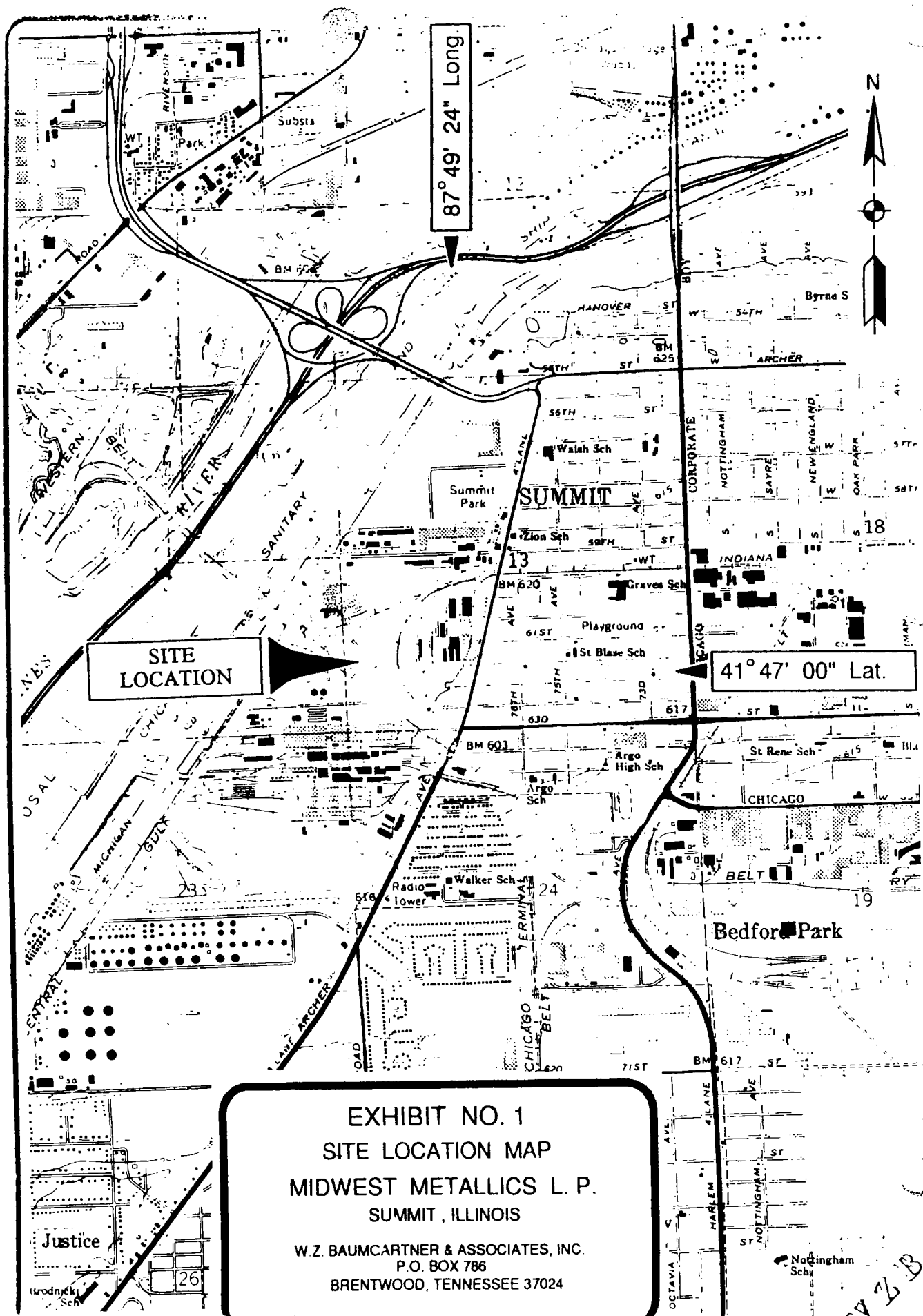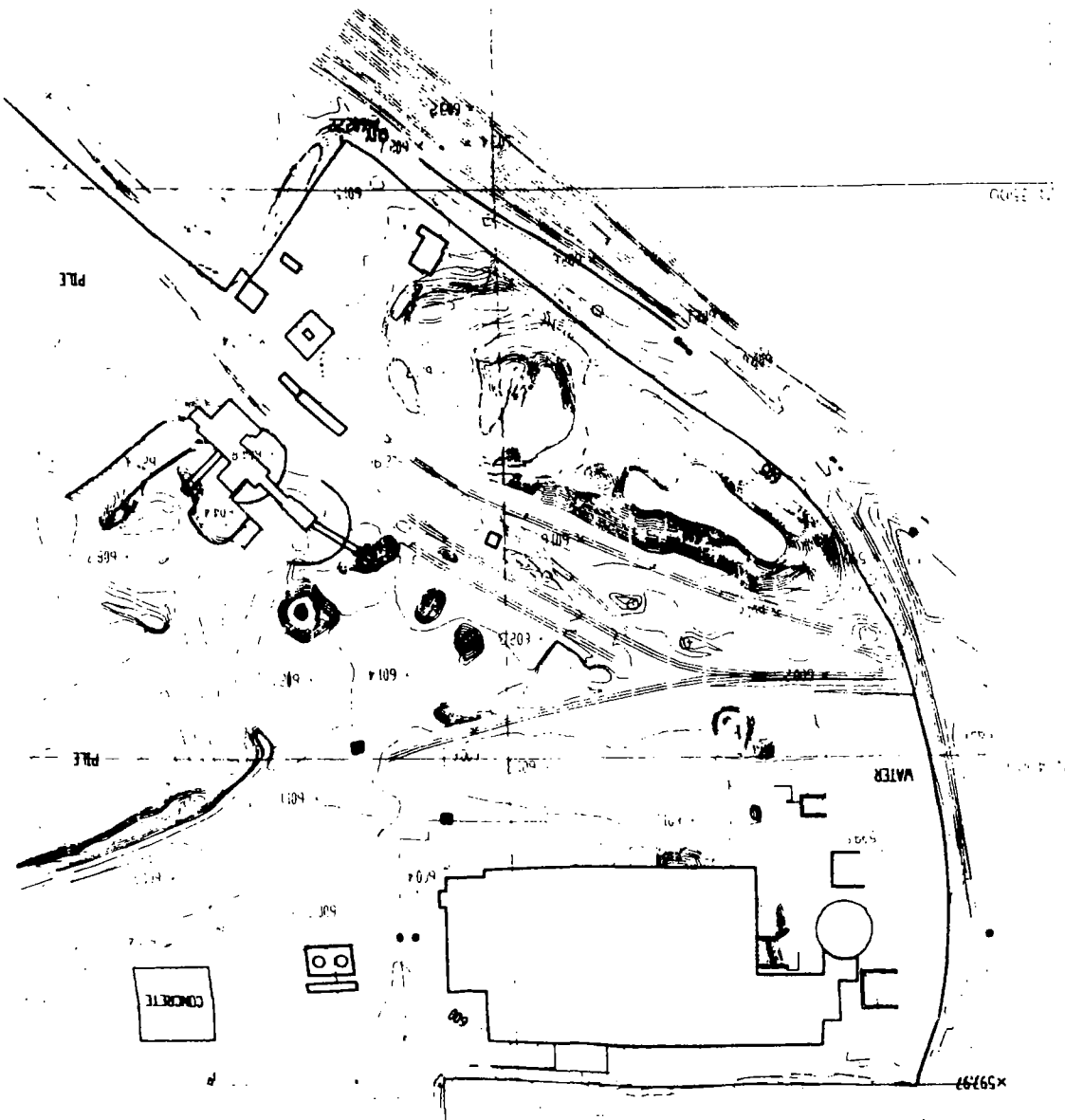
EXHIBIT NO. 1

SITE LOCATION MAP

MIDWEST METALLICS L. P.

SUMMIT, ILLINOIS

W.Z. BAUMCARTNER & ASSOCIATES, INC.
P.O. BOX 786
BRENTWOOD, TENNESSEE 37024

PILE

PILE

WATER

CONCRETE

×59797

RTNER & ASSOCIATES, INC.

DRAWN BY:	CLG		
CHECKED BY:	JCT		SEAL:
ENGINEER:	WZB		
DATE:	4/17/97		

EXHIB
SITE

MIDWEST MET
SUMMIT,

MATCH LINE A

MIDWEST METALLICS, L.P.
SUMMIT, ILLINOIS

EXHIBIT 2
SITE MAP

SHEET NO: 1 OF 1

PROJECT NO: 97031

SCALE: 1"=100'

CONTOUR INTERVAL: 1'

AERIAL TOPOGRAPHY PROVIDED BY:
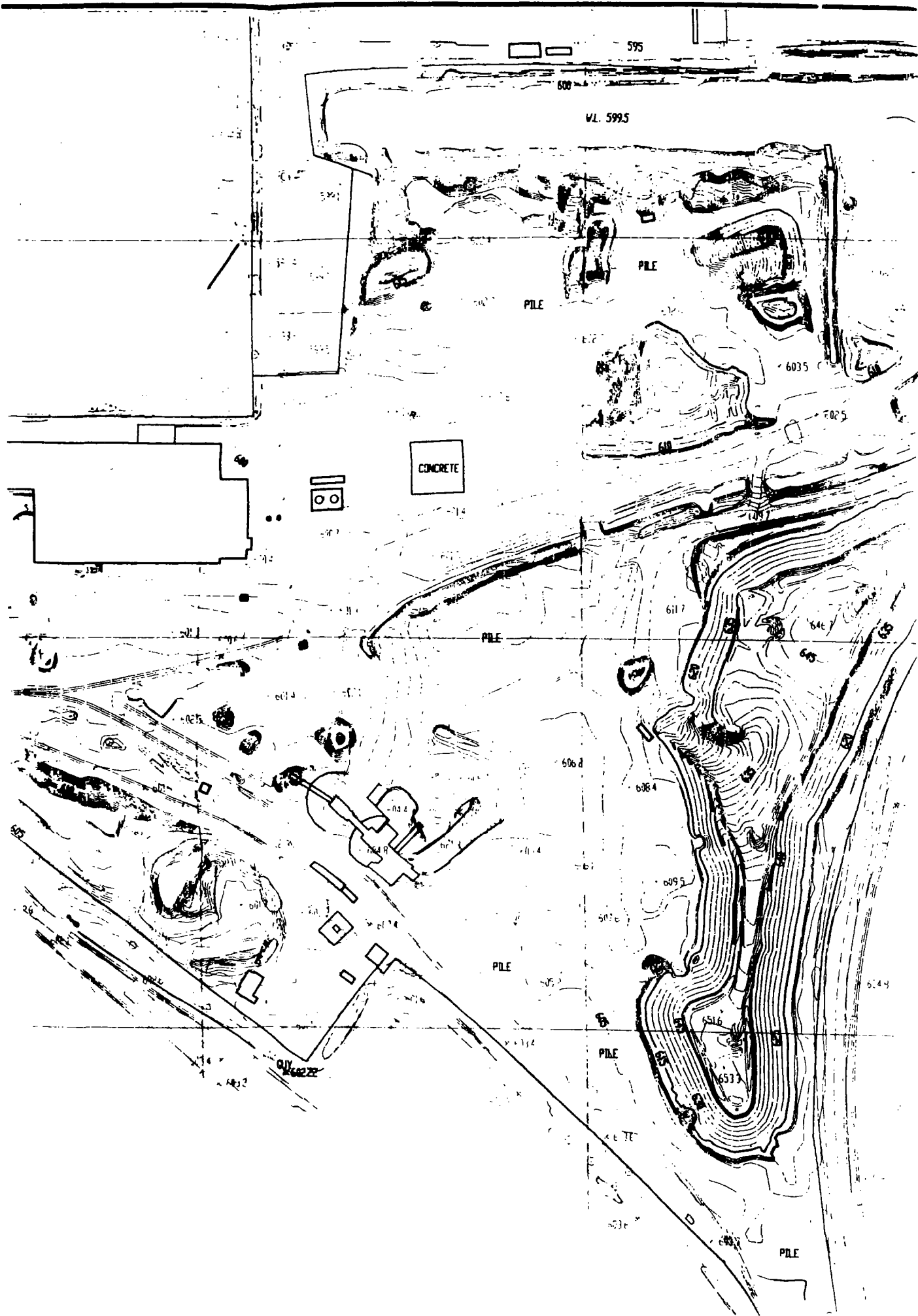AIR MAPS, INC.
628 JAY DEE ST.
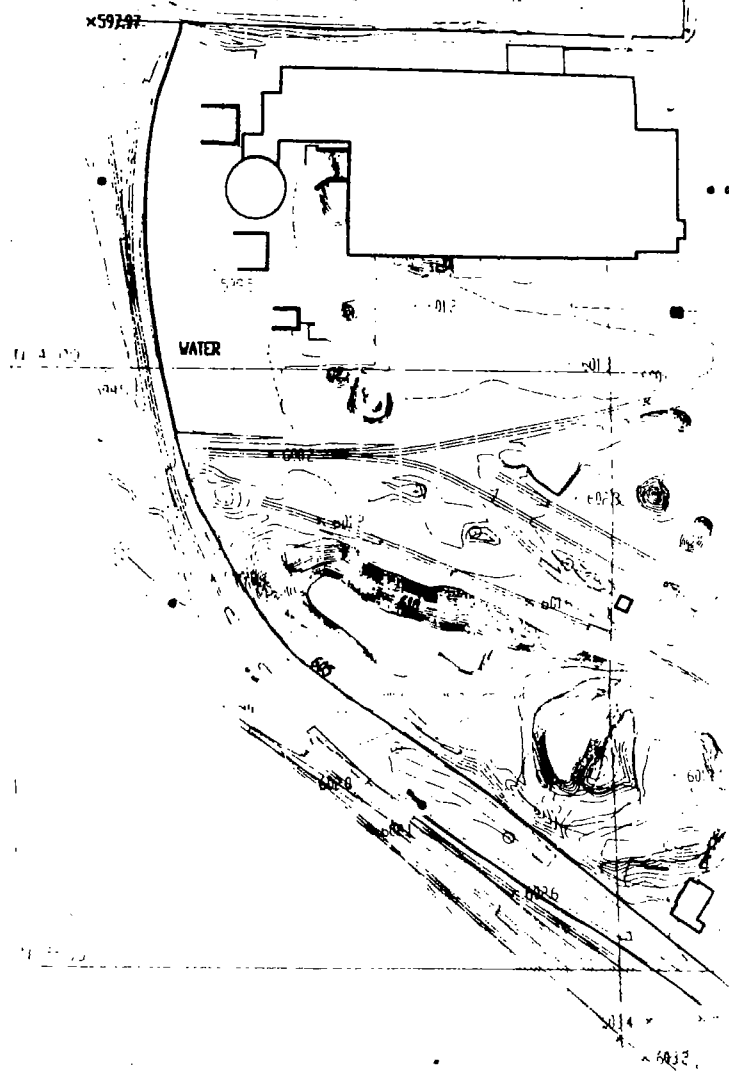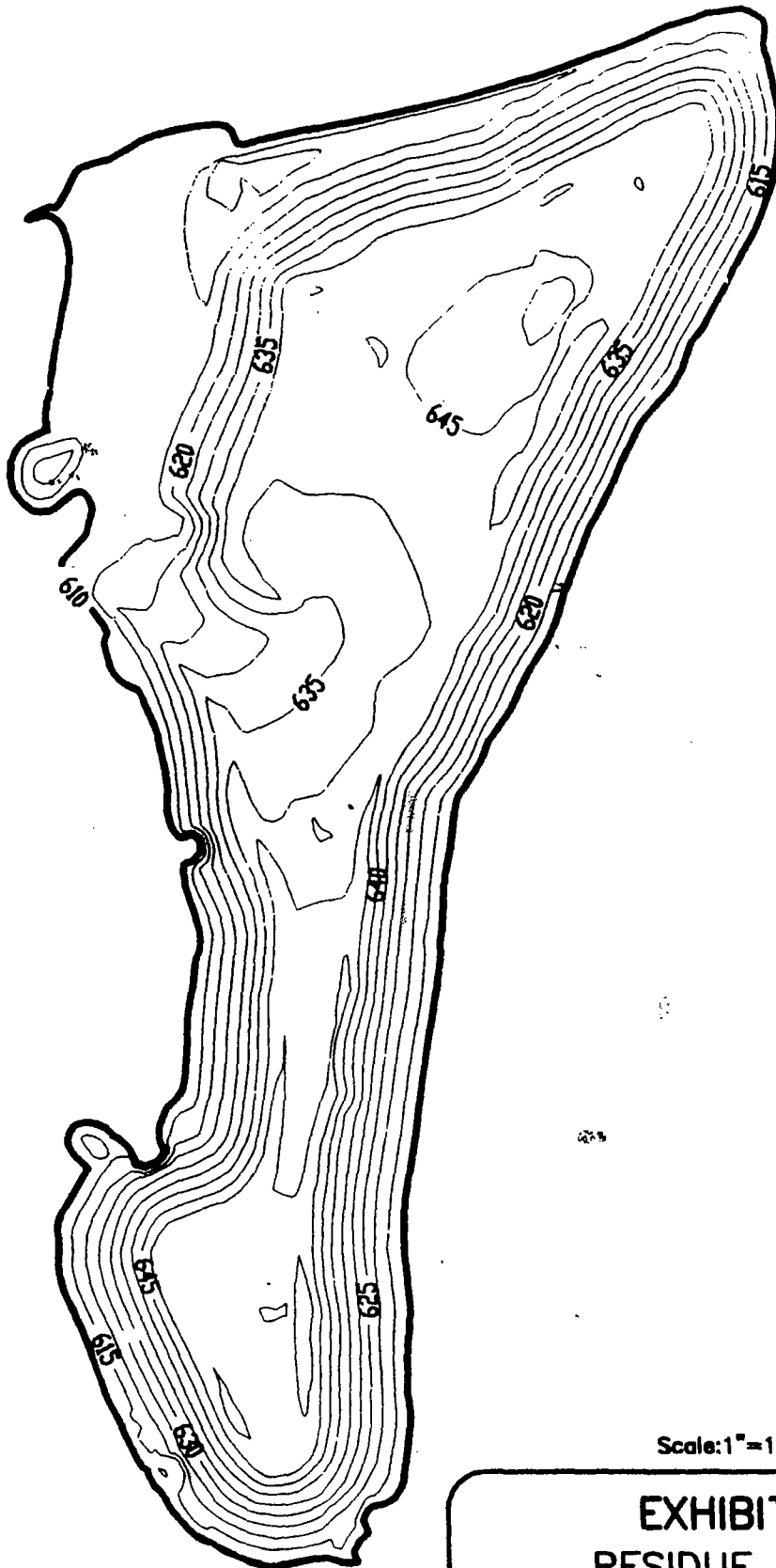ELKHART, IN 46514
DATE OF PHOTOGRAPHY: 4/21/96
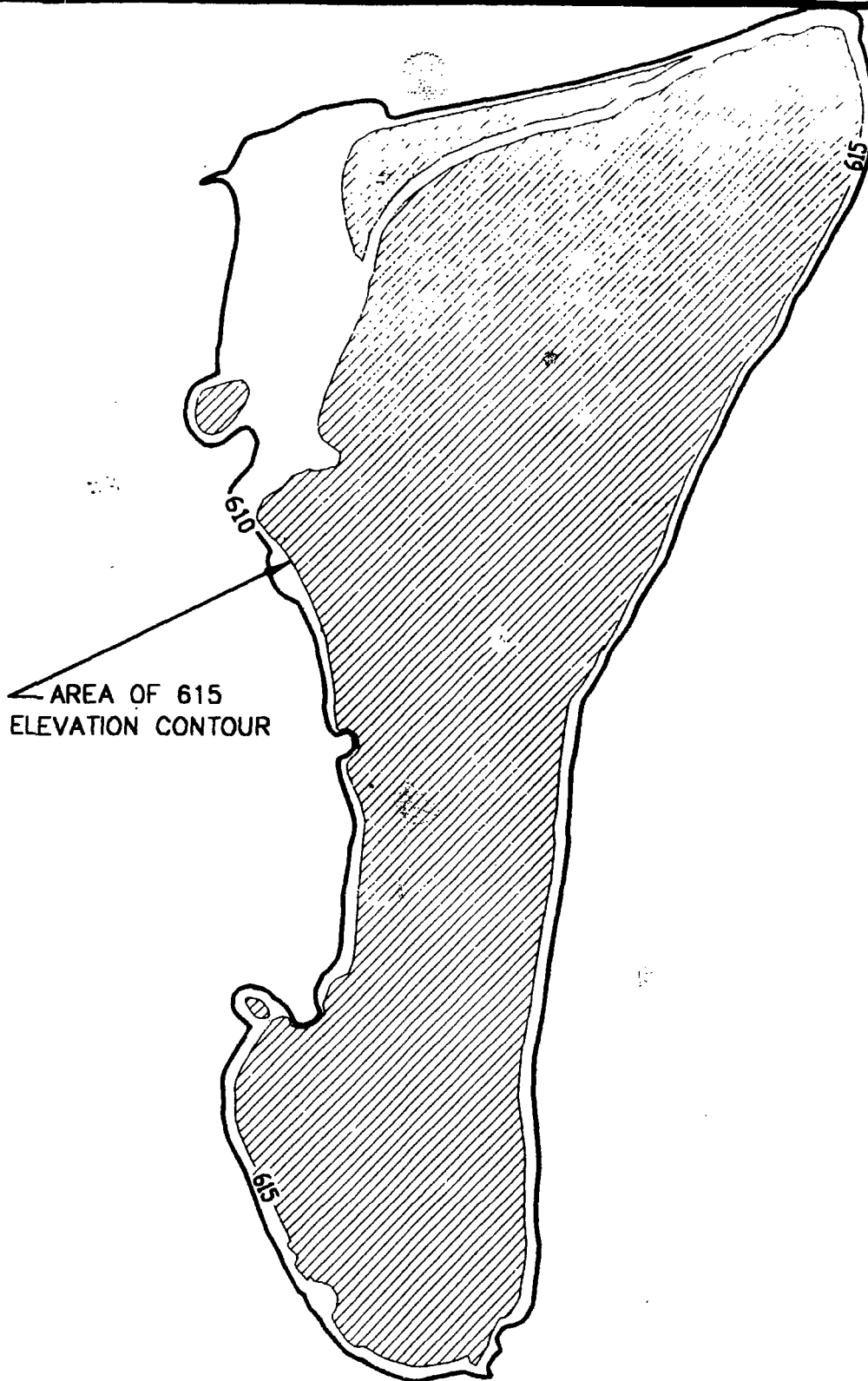
MATCH LINE A

N

MATCH LINE A

605

615

619

605

X 511

X 517

615

65

65

65

65

65

65

6048

PILE

M

×597.97

WATER
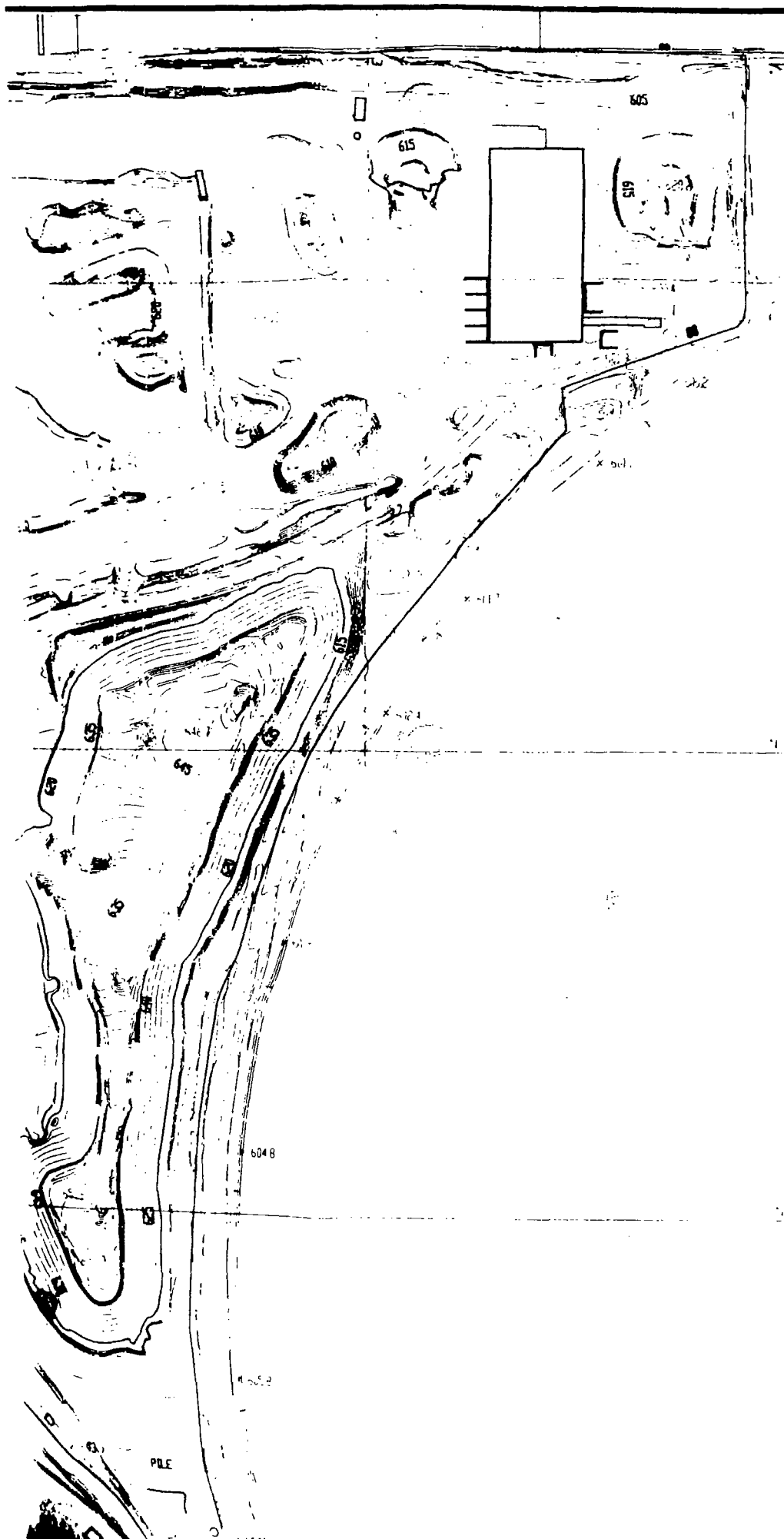
Scale:1"=100'

EXHIBIT 3
RESIDUE PILE
MIDWEST METALLICS,LP
SUMMIT, ILLINOIS
97031

N

AREA OF 615
ELEVATION CONTOUR

610

615

615

EXHIBIT 4
AREA CALCULATION OF
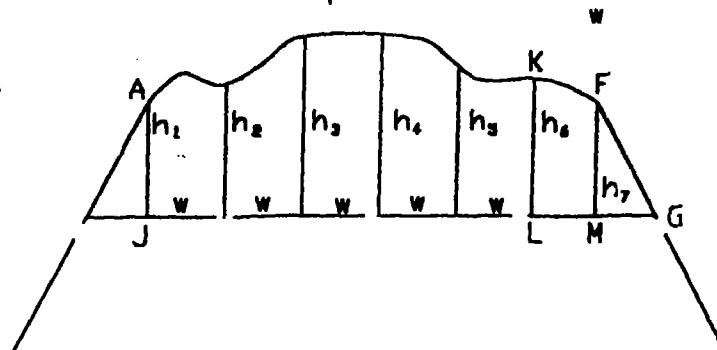SPECIFIC CONTOUR
MIDWEST METALLICS,LP
SUMMIT,ILLINOIS
97031

Scale:NONE

WZB

TRAPEZOID RULE

$$area = W\left(\frac{h_1 + h_n}{2} + h_2 + h_3 + \cdots + h_{n-1}\right)$$

W

example

h_1	=22.6	ft
h_2	=28.0	ft
h_3	=27.1	ft
h_4	=30.6	ft
h_3	=38.5	ft
h_6	=36.9	ft
h_7	=30.0	ft

HJ = 14 FT
LM = 13.5 FT
MG = 21 FT
W = 25 FT = COMMON SPACING
area AJH = (14.0)(22.6)/2 = 158 ft^2
area KFML = (36.9+30.0)(13.5)/2 = 451.16 ft^2
area FGM = (21.0)(30)/2 = 315 ft^2
area AJLK = ((22.6+30)/2)+28.0+27.1+30.6+38.5+36.9)(25)
            = 4685 ft^2

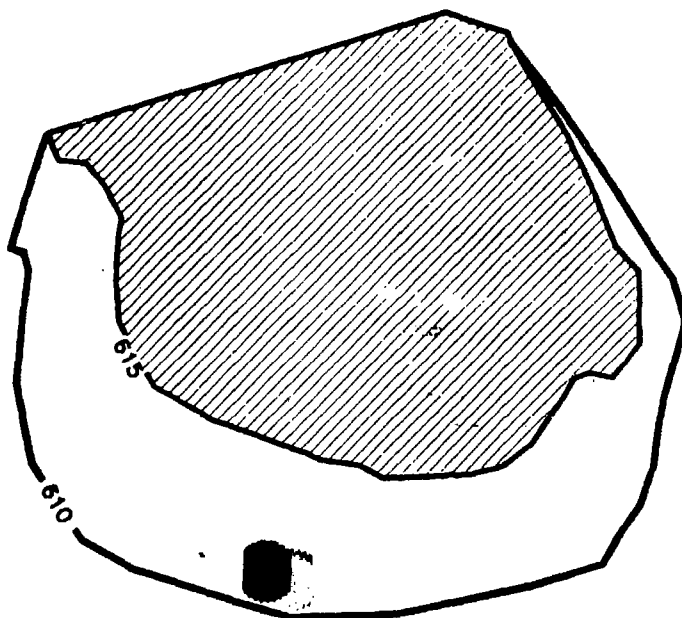The total area AFGH is therefore 5609.16 ft^2

EXHIBIT 5
AREA CALCULATION OF
SPECIFIC CONTOUR
MIDWEST METALLICS,LP
SUMMIT,ILLINOIS
97031

VOLUME BY AVERAGE END AREAS

CONTOUR INTERVAL=5'

$$V_{610 - 615} = 5 \times \frac{A_{610} + A_{615}}{2}$$

FOR TOTAL VOLUME ADD ALL AVERAGE END VOLUMES

EXHIBIT 6
VOLUME CALCULATION
MIDWEST METALLICS,LP
SUMMIT,ILLINOIS
97031

Scale:NONE